

WHAT IS CLAIMED IS:

1. A digital filter for filtering output of digital data comprising a plurality of channels, wherein

5       said digital filter divides said digital data into a plurality of data entities for each channel, multiplies an input rate for the said digital data by the number of channels, performs a filtering operation according to time sharing by further multiplying the input rate by the number  
10       of divisions, synthesizes filtering output results of data divided from the same digital data, and produces filtering output of said digital data for each channel based on a synthesis result.

15       2. A matched filter comprising:

      a data division section for dividing in-phase and quadrature-phase reception data into a plurality of data entities, wherein said reception data is obtained by converting an analog signal for the in-phase and the  
20       quadrature-phase spread-spectrum modulated by one type of spread code into a digital form at a specified sample rate, and for outputting said plurality of data entities as divided data in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of  
25       divisions;

      a data storage section for storing said divided data output from said data division section and outputting said

stored divided data for each chip in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions;

a despread code generation section for generating  
5 and outputting a despread code identical to said spread code in units of chips;

a correlation operation section comprising a plurality of multipliers and adders for performing a product-sum operation between said divided data output from said data  
10 storage section and said despread code output from said despread code generation section in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions and for outputting a correlation operation result; and

15 a data restoration section for synthesizing correlation operation results of divided data originating from the same reception data out of correlation operation results of divided data output from said correlation operation section and for performing correlation output of  
20 said in-phase and quadrature-phase reception data at every sample timing.

3. The matched filter according to claims 2, wherein in-phase and quadrature-phase reception data is respectively  
25 divided into two parts, namely high-order bits and low-order bits in units of bits.

4. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and the quadrature-phase by using the matched filter described in claims 2 based on correlation output for the in-phase and the quadrature-phase at every sample timing.

5. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and the quadrature-phase by using the matched filter described in claims 3 based on correlation output for the in-phase and the quadrature-phase at every sample timing.

6. A matched filter comprising:

a data division section for dividing in-phase and quadrature-phase reception data into a plurality of data entities, wherein said reception data is obtained by converting an analog signal for the in-phase and the quadrature-phase spread-spectrum modulated by in-phase and quadrature-phase spread codes into a digital form at a specified sample rate, and for outputting said plurality of data entities as divided data in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions;

a data storage section for storing said divided data output from said data division section and outputting said stored divided data for each chip in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied

by the number of divisions;

a despread code generation section for generating and outputting in-phase and quadrature-phase despread codes respectively identical to said in-phase and quadrature-phase spread codes in units of chips;

an in-phase correlation operation section comprising a plurality of multipliers and adders for performing a product-sum operation between said divided data output from said data storage section and said in-phase despread code output from said despread code generation section in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions and for outputting a correlation operation result;

a quadrature-phase correlation operation section comprising a plurality of multipliers and adders for performing a product-sum operation between said divided data output from said data storage section and said quadrature-phase despread code output from said despread code generation section in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions and for outputting a correlation operation result;

a data restoration section synthesizing correlation operation results of divided data originating from the same reception data out of correlation operation results of divided data output from said in-phase correlation operation section and said quadrature-phase correlation operation section and for outputting a synthesis result as a

correlation operation of reception data; and

a complex operation section for performing a complex operation based on a correlation operation result of said reception data output from said data restoration section and  
5 for generating correlation output for in-phase and quadrature-phase reception data at every sample timing.

7. The matched filter according to claims 6, wherein in-phase and quadrature-phase reception data is respectively  
10 divided into two parts, namely high-order bits and low-order bits in units of bits.

8. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and  
15 the quadrature-phase by using the matched filter described in claims 6 based on correlation output for the in-phase and the quadrature-phase at every sample timing.

9. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and  
20 the quadrature-phase by using the matched filter described in claims 7 based on correlation output for the in-phase and the quadrature-phase at every sample timing.

25 10. A matched filter comprising:

a data division section for dividing in-phase and quadrature-phase reception data into a plurality of data

entities, wherein said reception data is obtained by converting an analog signal for the in-phase and the quadrature-phase spread-spectrum modulated by in-phase and quadrature-phase spread codes into a digital form at a specified sample rate, and for outputting said plurality of data entities as divided data in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions;

a data storage section for storing said divided data output from said data division section and outputting said stored divided data for each chip in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions;

a despread code generation section for generating and outputting in-phase and quadrature-phase despread codes respectively identical to said in-phase and quadrature-phase spread codes in units of chips;

a correlation operation section comprising a plurality of multipliers and adders for performing a product-sum operation between said divided data output from said data storage section and despread codes for said in-phase and said quadrature-phase output from said despread code generation section in a time-sharing manner at a rate equivalent to said sample rate doubled and multiplied by the number of divisions and for outputting a correlation operation result;

a data restoration section for synthesizing results of a correlation operation at said rate using the same source

reception data and a despread code for the same phase output of correlation operation results of divided data output from said correlation operation section and for outputting a synthesis result as a correlation operation result of the reception data; and

a complex operation section for performing a complex operation based on a correlation operation result of said reception data output from said data restoration section and for generating correlation output for in-phase and quadrature-phase reception data at every sample timing.

11. The matched filter according to claims 10, wherein in-phase and quadrature-phase reception data is respectively divided into two parts, namely high-order bits and low-order bits in units of bits.

12. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and the quadrature-phase by using the matched filter described in claims 10 based on correlation output for the in-phase and the quadrature-phase at every sample timing.

13. A CDMA communication receiver for demodulating a spread spectrum modulated analog signal for the in-phase and the quadrature-phase by using the matched filter described in claims 11 based on correlation output for the in-phase and the quadrature-phase at every sample timing.